

11/15/13 Agenda

- Warm up

- **Remediation packet for Chapter 2 is on my web site,
you have until TODAY to get it to me!**

- Review Homework - Worksheet 3.6 day 1
 - Worksheet 3.6 day 2

- Section 3.7 - Absolute Value Equations

- Homework - Worksheet 3.7 - Absolute Value Equations

Warmup:

- Grab a slip of paper
- Put your name on it
- Distribute & CLT

$$\begin{array}{r} -2k - (3k + 4) \\ \hline -2k \quad -3k \quad -4 \\ \hline -5k - 4 \end{array}$$

Diagram illustrating the distributive property and simplification of the expression $-2k - (3k + 4)$. The expression is shown as $-2k - (3k + 4)$ with a blue arrow indicating the distribution of the negative sign to the terms inside the parentheses. Below, the terms are separated: $-2k$, $-3k$, and -4 . A green arrow points from these terms to the simplified result $-5k - 4$.

$$\begin{array}{r} 3k + 4 \\ -1 \left[\begin{array}{|c|c|} \hline -3k & -4 \\ \hline \end{array} \right] \\ \hline -3k - 4 \end{array}$$
$$\begin{array}{r} -2k \\ -3k \\ \hline -5k \end{array}$$

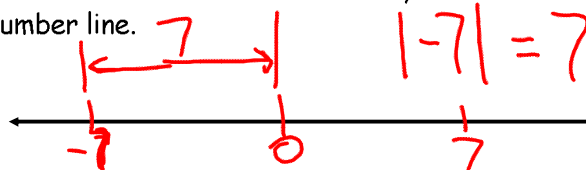


Section 3.7 - Absolute Value Equations Target 3F

Goal: Solve absolute value equations.

What is an absolute value?

An absolute value is distance away from zero on the number line.



Think about it...

Can we have a negative distance? How far away is -7 from zero?

$$|-7| = 7$$

Examples:

In words: What is the absolute value of 3?

In symbols: $|3| = 3$

$$|-4| = 4$$

$$|-4.8| = 4.8$$

What numbers could we put in for x and solve this equation? (use mental math)

$$|x| = 5 \quad x = \underline{-5} \text{ or } \underline{+5}$$

$$|x| = 20 \quad x = \underline{-20} \text{ or } \underline{+20}$$

$$|x| = 7 \quad x = \underline{7} \text{ or } \underline{-7}$$

$$|x| = 2 \quad x = \underline{2} \text{ or } \underline{-2}$$

Can absolute value be negative??

~~$|x| = -3$~~ **NO!**

$$|-3| = 3$$

$$|3| = 3$$

$$|-3| = 3$$

$$|+3| = 3$$

$$|---3| =$$

$$3$$

Section 3.7 - Absolute Value Equations Target 3F

Steps for
Solving
Absolute Value
Equations:

- Rules: 1.) Complete the operations necessary to get rid of all numbers outside of the absolute value sign. (PEMDAS)
- 2.) Separate the equation into TWO parts.
(+ and -)
- 3.) Solve each equation separately.
- 4.) Write the answer using the word "or".

$$|x - 4| = 5$$

$$\begin{array}{l} x - 4 = 5 \text{ or } x - 4 = -5 \\ \underline{+4 \quad +4} \quad \underline{+4 \quad +4} \\ x = 9 \text{ or } x = -1 \\ \{9, -1\} \end{array}$$

$$|x + 5| = 6$$

$$\begin{array}{l} x + 5 = 6 \text{ or } x + 5 = -6 \\ \underline{-5 \quad -5} \quad \underline{-5 \quad -5} \\ x = 1 \text{ or } x = -11 \\ \{1, -11\} \end{array}$$

$$|5x| = 35$$

$$\begin{array}{l} 5x = 35 \text{ or } 5x = -35 \\ \underline{\div 5 \quad \div 5} \quad \underline{\div 5 \quad \div 5} \\ x = 7 \text{ or } x = -7 \\ \{7, -7\} \end{array}$$

$$\{5, -7\} \quad \frac{2|x+1|}{2} = \frac{12}{2}$$

$$\begin{array}{l} |x+1| = 6 \\ x+1 = 6 \text{ or } x+1 = -6 \\ \underline{-1 \quad -1} \quad \underline{-1 \quad -1} \\ x = 5 \text{ or } x = -7 \end{array}$$

$$|2x - 7| - 4 = 4$$

$$\begin{array}{l} \underline{+4 \quad +4} \\ |2x - 7| = 8 \end{array}$$

$$\begin{array}{l} \underline{-3 \quad -3} \\ -3|x+5| = -15 \\ |x+5| = 5 \end{array}$$

$$\begin{array}{l} 2x - 7 = 8 \text{ or } 2x - 7 = -8 \\ \underline{+7 \quad +7} \quad \underline{+7 \quad +7} \\ \frac{2x}{2} = \frac{15}{2} \quad \frac{2x}{2} = \frac{-1}{2} \\ x = 7\frac{1}{2} \quad x = -\frac{1}{2} \end{array}$$

$$\{7.5, -0.5\}$$

$$\{7\frac{1}{2}, -\frac{1}{2}\}$$

You Try!!

$|x - 2| = 5$

$\{7, -3\}$

$$\begin{array}{r} x-2=5 \quad \text{or} \quad x-2=-5 \\ +2 \quad +2 \quad \quad +2 \quad +2 \\ \hline x=7 \quad \text{or} \quad x=-3 \end{array}$$

$|x + 2| = 8$

$\{6, -10\}$

$$\begin{array}{r} x+2=8 \quad \text{or} \quad x+2=-8 \\ -2 \quad -2 \quad \quad -2 \quad -2 \\ \hline x=6 \quad \text{or} \quad x=-10 \end{array}$$

$|x| - 3 = 7$

$|x + 1| + 2 = 4$

What about
this one?

$|2x + 3| + 4 = 9$

Or this one?

$$\begin{array}{r} |x+1|+9=3 \\ -9 \quad -9 \\ \hline |x+1| = -6 \end{array} \quad (2) \left(\frac{|x+1|}{2} \right) = (4)(2)$$

NO SOLUTION

$$|x+1| = 8$$

Rules: 1.) Complete the operations necessary to get rid of all numbers outside of the absolute value sign. (PEMDAS)

2.) Separate the equation into **TWO** parts. (+ and -)

3.) Solve each equation separately.

4.) Write the answer using the word "or".

You Try!!

$|x - 2| = 5$

$|x + 2| = 8$

$|x| - 3 = 7$

$|x + 1| + 2 = 4$

What about
this one?

$$(3)\left(\frac{|x + 4|}{3}\right) = (5)(3) \quad |x + 4| = 15$$

Or this one?

$$|x + 1| + 9 = 3$$

$$\underline{-9 \quad -9}$$

$$|x + 1| = -6 \quad \text{NO SOLUTION}$$

Rules: 1.) Complete the operations necessary to get rid of all numbers outside of the absolute value sign. (PEMDAS)

2.) Separate the equation into **TWO** parts. (+ and -)

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4.) Write the answer using the word "or".